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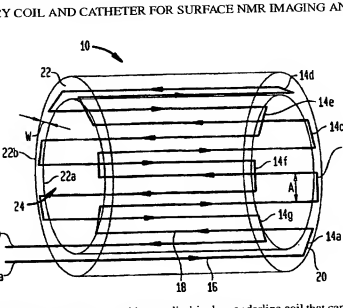
(54) Title: RADIOFREQUENCY COIL AND CATHETER FOR SURFACE NMR IMAGING AND SPECTROSCOPY



(57) Abstract: In one aspect, the present invention provides a cylindrical meanderline coil that can significantly improve the performance and usefulness of nuclear magnetic resonance (NMR) catheter radiofrequency (RF) coils by shaping the spatial dimensions of the volume of excitation and reception of signal. This can provide improved accuracy in defining the volume of excitation and reception of the subject or specimen, and increase the signal to noise ratio of a received signal. In another aspect, the invention provides an intravascular catheter having a coil at its tip for generating and/or detecting magnetic excitations. A preamplifer coupled to the catheter in proximity of the coil allows amplifying signals generated and/or detected by the coil. Although in one application, a coil and/or a catheter of the invention can be employed, for example, for MR spectroscopy or imaging of biological tissue, such as atherosclerotic plaques arterial walls in the human body, the invention provides similar advantages in any situation where a magnetic resonance or other magnetic induction signal is to be received from a thin cylindrical shell or sector of a cylindrical shell.

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